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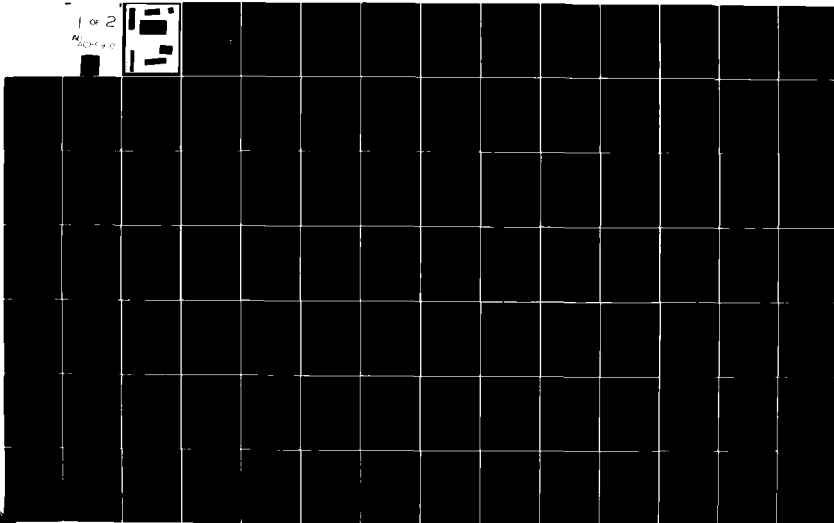
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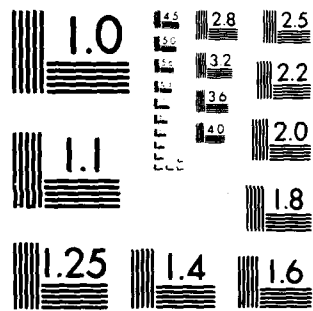
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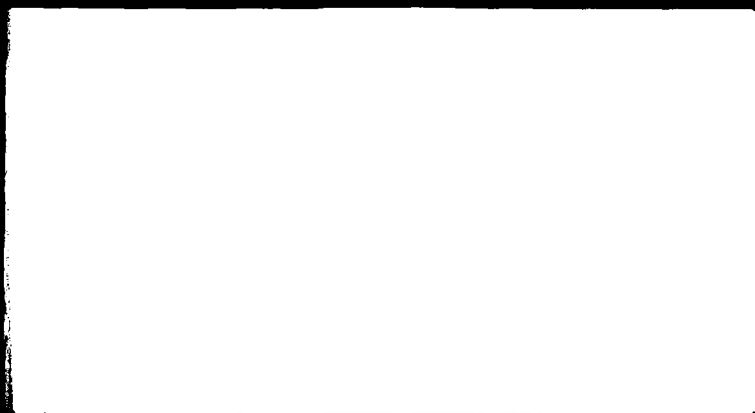


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APPENDIX 41.

COMPETENCY CURRICULUM FOR
ENVIRONMENTAL HEALTH ASSISTANT

APPLICATION OF A SYSTEM APPROACH
U.S. NAVY MEDICAL DEPARTMENT
EDUCATION AND TRAINING PROGRAMS
FINAL REPORT

AUGUST 31, 1974

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Prepared under Contract to
OFFICE OF NAVAL RESEARCH
U.S. DEPARTMENT OF THE NAVY

Quida C. Upchurch, Capt., NC, USN
Program Manager
Education and Training R&D
Bureau of Medicine and Surgery (Code 71G)

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currently designated Navy enlisted occupations, 20 Naval Enlisted Classification Codes (NEC's) were computerized. A set of 16 groupings that cover all designated occupations was developed so as to enhance the effectiveness of professionals and sub-professionals alike.

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FOREWORD

The project, "Application of a System Approach to the Navy Medical Department Education and Training Programs," was initiated in May of 1969 as a realistic, comprehensive response to certain objectives set forth in ADO 43-03X, and to memoranda from both the Secretary of Defense and the Assistant Secretary of Defense, Manpower and Reserve Affairs. The Secretary's concern was stated in his memorandum of 29 June 1965, "Innovation in Defense Training and Education." More specific concerns were stated in the Assistant Secretary's memorandum of 14 June 1968, "Application of a System Approach in the Development and Management of Training Courses." In this he called for "vigorous and imaginative effort," and an approach "characterized by an organized training program with precise goals and defined operational interrelation among instructional system components." He also noted, "Job analyses with task descriptions expressed in behavioristic terms are basic and essential to the development of precise training goals and learning objectives."

The Project

System survey and analysis was conducted relative to all factors affecting education and training programs. Subsequently, a job-analysis sub-system was defined and developed incorporating a series of task inventories "...expressed in behavioristic terms..." These inventories enabled the gathering of job activity data from enlisted job incumbents, and data relating to task sharing and delegation from officers of the Medical, Nurse and Dental Corps. A data management sub-system was devised to process incumbent data, then carry out needed analyses. The development of initial competency curricula based upon job analysis was implemented to a level of methodology determination. These methods and curriculum materials constituted a third (instructional) sub-system.

Thus, as originally proposed, a system capability has been developed in fulfillment of expressed need. The system, however, remains untested and unevaluated. ADO 43-03X called for feasibility tests and cost-effectiveness determination. The project was designed to so comply. Test and evaluation through the process of implementation has not proved feasible in the Navy Medical Department within the duration of the project. "As designed and developed the system does have "...precise goals and defined operational interrelation among instructional system components." The latter has been achieved in terms of a recommended career structure affording productive, rewarding manpower utilization which bridges manpower training and health care delivery functions.

Data Management Sub-System

Job analysis, involving the application of comprehensive task inventories to thousands of job incumbents, generates many millions of discrete bits of response data. They can be processed and manipulated only by high speed computer capability using rigorously designed specialty programs. In addition to numerical data base handling, there is the problem of rapidly and accurately manipulating a task statement data base exceeding ten thousand carefully phrased behavioral statements. Through the use of special programs, task inventories are prepared, printouts for special purposes are created following a job analysis application, access and retrieval of both data and tasks are efficiently and accurately carried out, and special data analyses conducted. The collective programs, techniques and procedures comprising this sub-system are referred to as the Navy Occupational Data Analysis Language (NODAL).

Job Analysis Sub-System

Some twenty task inventory booklets (and associated response booklets) were the instruments used to obtain job incumbent response data for more than fifty occupations. An inventory booklet contains instructions, formatted questions concerning respondent information ("bio-data"), response dimension definitions, and a list of tasks which may vary in number from a few hundred to more than a thousand per occupational field.

By applying NODAL and its associated indexing techniques, it is possible to assemble modified or completely different inventories than those used in this research. Present inventories were applied about three years ago. While they have been rendered in operational format, they should not be re-applied until their task content is updated.

Response booklets were designed in OPSCAN mode for ease of recording and processing responses.

Overall job analysis objectives and a plan of administration were established prior to inventory preparation, including the setting of provisional sample target sizes. Since overall data attrition was forecast to approximate twenty percent, final sample and sub-sample sizes were adjusted accordingly. Stratified random sampling techniques were used. Variables selected (such as rating, NEC, environment) determined stratifications, together with sub-population sizes. About fifteen percent of large sub-populations were sought while a majority or all members of small sub-populations were sought.

Administration procedures were established with great care for every step of the data collecting process, and were coordinated with sampling and data analysis plans. Once set, the procedures were formalized as a protocol and followed rigorously.

Instructional Sub-System

Partial "competency curricula" have been composed as an integral sub-system bridging what is required as performance on the job with what is, accordingly, necessary instruction in the training process. Further, curriculum materials were developed to meet essential requirements for implementing the system so that the system could be tested and evaluated for cost effectiveness. However, due to the fact that test and evaluation was not feasible in the Navy Medical Department within the duration of the project, it was not possible to complete the development of the system through the test and evaluation phase. The inability to complete this phase also interrupted the planned process for fully developing the curricula; therefore, instead of completed curricula ready for use in the system, the curricula were partially developed to establish the necessary sub-system methodology. The competency curricula are based on tasks currently performed by job incumbents in 1971. (The currency of a given curriculum depends upon periodic analysis of incumbents' jobs, and its quality control resides in the evaluation of the performance competency of the program's graduates.)

A competency curriculum provides a planned course of instruction or training program made up of sequenced competency units which are, in turn, comprised of sequenced modules. These modules, emphasizing performance objectives, are the foundation of the curriculum.

A complete module would be comprised of seven parts: a cluster of related tasks; a performance objective; a list of knowledges and skills implied by the objective; a list of instructional strategies for presenting the knowledges and skills to the learner; an inventory of training aids for supporting the instructional strategies; a list of examination modes; and a statement of the required training time. In this project, curriculum materials have been developed to various levels of adequacy, and usually comprise only the first three parts; the latter four need to be prepared by the user.

The performance objective, which is the most crucial part of the module, is the basis for determining curriculum content. It is composed of five essential elements: the stimulus which initiates the behavior; the behavior; the conditions under which the behavior takes place; the criteria for evaluating the behavior; and the consequence or results of the behavior. A sixth element, namely next action, is not essential; however, it is intended to provide linkage for the next behavior.

Knowledges and skills listed in the module are those needed by the learner for meeting the requirements of the performance objective.

Instructional strategies, training aids, examination modes and training time have been specified only for the Basic Hospital Corps Curriculum. The strategies, aids and modes were selected on the basis of those considered to be most supportive in presenting the knowledges and skills so as to provide optimum learning effectiveness and training efficiency. The strategies extend from the classroom lecture as traditionally presented by a teacher to the more sophisticated mediated program for self-instruction. The training aids, like strategies, extend from the traditional references and handout material in the form of a student syllabus to mediated programs for self-instruction supported by anatomical models. Examination modes extend from the traditional paper and pencil tests to proficiency evaluation of program graduates on the job, commonly known as feedback. Feedback is essential for determining learning effectiveness and for quality control of a training program. The kind of instructional strategies, training aids and examination modes utilized for training are limited only by such factors as staff capability and training budget.

The training time specified in the Basic Hospital Corps Curriculum is estimated, based upon essential knowledge and skills and program sequence.

The competency curriculum module, when complete, provides all of the requirements for training a learner to perform the tasks set forth in the module. A module may be used independently or related modules may be re-sequenced into modified competency units to provide training for a specific job segment.

Since the curricula are based upon tasks performed by job incumbents in 1971, current analysis of jobs needs to be accomplished using task inventories that have been updated to reflect changes in performed tasks. Subsequent to job analysis, a revision of the curricula should be accomplished to reflect task changes. When the foregoing are accomplished, then faculty and other staff members may be indoctrinated to the competency curricula and to their relationship to the education and training system.

In addition to the primary use for the systematic training of job incumbents, these curricula may be used to plan for new training programs, develop new curricula, and revise existing curricula; develop or modify performance standards; develop or modify proficiency examinations; define billets; credentialize training programs; counsel on careers; select students; and identify and select faculty.

The System

Three sub-systems, as described, comprise the proposed system for Education and Training Programs in The Navy Medical Department. This exploratory and advanced developmental research has established an overall methodology for improved education and training incorporating every possible means of providing bases for demonstrating feasibility and cost effectiveness. There remains only job analysis sub-system updating, instructional sub-system completion, and full system test and evaluation.

Acknowledgements

The authors wish to acknowledge the invaluable participation of the several thousands of Naval personnel who served as respondents in inventory application. The many military and civilian personnel who contributed to developmental efforts are cited by name in the Final Report.

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Identity and acknowledgement of the project Advisory Group during the project's final year is recorded in the Final Report.

Lastly, the project could not have been commenced nor carried out without the vision, guidance and outstanding direction of Ouida C. Upchurch, Capt., NC, USN, Project Manager.

TABLE OF CONTENTS

COMPETENCY CURRICULUM FOR

ENVIRONMENTAL HEALTH ASSISTANT

<u>Units/Modules</u>	<u>Page</u>
I. <u>Public Health Microbiology</u>	1
1. Collection of Specimens for Microbial Examination.	2
2. Preparation, Preservation and Shipment of Specimens to Laboratory	3
3. Culture Media Preparation	5
4. Stain Preparation	6
5. Microscope Screening of Bacteria	7
6. Darkfield Examination for <u>Treponema pallidum</u>	8
7. Preliminary Identification of Medically Important Bacteria	9
8. Syphilis Screening	10
9. Water Potability Testing	11
10. Environmental Bacterial Counts	12
II. <u>Epidemiology</u>	13
1. Reportable Diseases	14
2. Investigation of Foodborne or Waterborne Disease Outbreak	15
3. Detection of Human Carriers of Infection	16
4. Diagnostic Testing Procedures	17
5. Immunizations	18
6. Procedures for Preparation of Tuberculin Retesting Annual Report	19
7. Venereal Disease Interviewing	20
8. Venereal Disease Reporting	21
9. Venereal Disease Education and Prevention	22
10. Rabies	23
III. <u>Public Health Statistics</u>	25
1. Compilation of Vital Statistics	26
2. Presentation of Data	27
3. Collection of Data on a Selected Sample	28
IV. <u>Rodents</u>	29
1. Rodent Survey	30
2. Rodent Control	32

<u>Units/Modules</u>	<u>Page</u>
V. <u>Medical Entomology and Pest Control Technology</u> . .	34
1. Arthropod Survey	35
2. Arthropod Identification	37
3. Pesticide Handling and Safety	38
4. Pesticide Formulation and Calculations	40
5. Indoor Pesticide Dispersal	41
6. Outdoor Pesticide Dispersal	42
7. Entomologic Laboratory Techniques	43
8. Entomologic Rearing Techniques	44
VI. <u>Medical Parasitology</u>	45
1. Survey and Collection of Parasite Specimens . .	46
2. Preparation of Specimens	47
3. Identification of Parasites	48
VII. <u>Food Sanitation</u>	49
1. Inspection of Food Service Personnel	50
2. Inspection of Food Service Facilities	51
3. Inspection of Food Products	53
4. Food Service Training	55
VIII. <u>Water Sanitation</u>	56
1. Examination and Evaluation of Potable Water Supply Systems	57
2. Examination and Evaluation of Recreational Water	58
3. Chlorine Testing	59
4. Water Chlorination Procedures	60
IX. <u>Sewage</u>	61
1. Sewage Treatment	62
2. Bacteriologic Testing of Sewage	63
X. <u>Poisonous Plants</u>	64
1. Poisonous Plants	65
XI. <u>Poisonous Reptiles</u>	66
1. Poisonous Reptiles	67
XII. <u>Habitability</u>	68
1. Inspections and Surveys	69

<u>Units/Modules</u>	<u>Page</u>
XIII. <u>Hospital Infection Control</u>	71
1. Monitoring Environment and Personnel	72
2. Monitoring Equipment and Supplies	73
3. Reporting Infections to Hospital Infection Committee	74
4. Infusion Product and Drug Culturing	75
XIV. <u>Industrial Hygiene/Occupational Health</u>	76
1. Conducting Industrial Safety Inspections	77
2. Checking for Hazardous Gases and Fumes	78
3. Checking for Electrical Hazards	79
4. Lighting Survey	80
5. Noise Level Surveys	81
XV. <u>NBC Emergency Operations</u>	82
1. NBC Emergency Operations	83
XVI. <u>Operational Sanitation</u>	84
1. Field Habitability Inspection	85
2. Field Food and Water Inspections	86
3. Field Waste Disposal	87

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

COMPETENCY UNIT I: PUBLIC HEALTH MICROBIOLOGY

This unit includes the following Modules:

<u>Number</u>	<u>Title</u>	<u>Page</u>
1	Collection of Specimens for Microbial Examination	2
2	Preparation, Preservation and Shipment of Specimens to Laboratory.	3
3	Culture Media Preparation	5
4	Stain Preparation	6
5	Microscope Screening of Bacteria.	7
6	Darkfield Examination for <u>Treponema pallidum</u>	8
7	Preliminary Identification of Medically Important Bacteria.	9
8	Syphilis Screening.	10
9	Water Potability Testing.	11
10	Environmental Bacterial Counts.	12

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Microbiology

MODULE 1: COLLECTION OF SPECIMENS FOR MICROBIAL EXAMINATION

- TASKS
- a. Prepare sample containers for sterilization and storage
 - b. Collect food/water sample for bacterial/parasite test
 - c. Collect samples of sewage effluent for analysis
 - d. Collect/preserve for culture or examination samples related to human carriers
 - e. Collect surface contamination samples using APHA swab-rinse sampling procedures
 - f. Collect surface samples using Rodac procedure

PERFORMANCE OBJECTIVE

- | | |
|---------------|--|
| (Stimulus) | When investigating the outbreak of disease |
| (Behavior) | The EHA will collect nose, throat, rectal, penile, skin, water and food specimens for microbiologic, parasitologic and viral analysis |
| (Conditions) | Without supervision; using appropriate equipment, e.g., sterile cotton swabs, spatulas, wide-mouth jars and wire loops, transport media (e.g., buffered glycerin, Stewart's media) |
| (Criteria) | Specimens collected under aseptic conditions, properly identified and adequate in amount for complete laboratory testing |
| (Consequence) | Results in the procurement of specimens for culture |
| (Next Action) | Send the specimens to the laboratory |

KNOWLEDGES AND SKILLS

Aseptic technique
Biologic containers
Appropriate specimens to be collected during an outbreak of disease
Sterilization techniques
Proper specimen labeling
Procedures for aseptically collecting and packaging specimens

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Microbiology

MODULE 2: PREPARATION, PRESERVATION AND SHIPMENT OF
SPECIMENS TO LABORATORY

- TASKS
- a. Prepare/preserve milk/water/food samples for shipment
 - b. Preserve animal brains or heads for rabies studies
 - c. Prepare, label and send routine specimens, e.g., urine, blood, to laboratory
 - d. Prepare/preserve tissue specimen for shipment
 - e. Prepare/preserve thick and thin blood films for laboratory examination
 - f. Collect venous blood sample
 - g. Pickup/deliver specimens
 - h. Centrifuge blood and separate serum or plasma
 - i. Collect capillary blood sample, i.e., from finger tip, toe or ear lobe
 - j. Ship specimens to laboratory for analysis

PERFORMANCE OBJECTIVE

- (Stimulus) When investigating the outbreak of disease
(Behavior) The EHA will prepare and preserve specimens and ship to the appropriate laboratory for analysis
(Conditions) Without supervision
(Criteria) Proper preparation, preservation and shipment of specimens to insure their arrival at the laboratory in viable condition for testing
(Consequence) The satisfactory presentation to the laboratory of specimens suspected to be associated with an outbreak of disease
(Next Action) Appropriate analysis of specimens by the laboratory

KNOWLEDGES AND SKILLS

Principles and techniques for preparing and preserving various specimens for analysis, e.g., milk, food, feces, urine, blood serum, sputum
Volume of specimen(s) required for analysis
Procedures for packaging biological specimens, e.g., appropriate containers, temperatures, labeling
Domestic and international postal regulations regarding shipment of biological specimens

MODULE 2 (Continued)

Military regulations and directives
concerning specimens

Time limits for arrival at laboratory so
that sample is valid for testing

Aseptic techniques

Preparation of laboratory request forms

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Microbiology

MODULE 3: CULTURE MEDIA PREPARATION

- TASKS
- a. Check/adjust pH of buffers/reagents
 - b. Prepare culture media using commercially dehydrated product; e.g., McConkey Agar
 - c. Sterilize media
 - d. Weigh/measure chemicals
 - e. Standardize reagents
 - f. Maintain stock of chemicals and dehydrated media

PERFORMANCE OBJECTIVE

- (Stimulus) Upon receiving a request for a bacteriologic test
(Behavior) The EHA will weigh and measure the culture media ingredients; prepare the culture media (including selective, differential and transport media; adjust the pH and sterilize the media prior to dispensing it into sterile petri dishes or other containers
(Conditions) Without supervision; using a pH meter, volumetric flasks, analytical balance, pipettes and autoclave
(Criteria) Accurately performed according to prescribed media preparation formulas
(Consequence) This action will produce media that will support the viability of culture organisms
(Next Action) Culture the organisms

KNOWLEDGES AND SKILLS

Principles and procedures for sterilizing media and criteria for sterilizing various media
Use and operation of related equipment; e.g., pH meter, pipette, volumetric glassware, automatic pipetting machine, autoclave
Reason for inclusion of specific ingredients in media
Nutritional requirements of bacteria
Principles and technique of dissolving a prepared powdered medium

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Microbiology

MODULE 4: STAIN PREPARATION

TASKS a. Prepare routine stains
 b. Prepare special stains
 c. Maintain stock of required solutions

PERFORMANCE OBJECTIVE

(Stimulus) When required
(Behavior) The EHA will prepare routine and special stains
 for use in the laboratory; and maintain an adequate supply of stains (single-dye or combination of dye solutions and reagents) to produce differential staining
(Conditions) Without supervision; using an analytical balance and volumetric measuring devices
(Criteria) According to the U.S. Navy Manual for Clinical Bacteriology and Mycology
(Consequence) This action will result in adequate quality and quantities of solutions for staining bacteria, yeasts and molds
(Next Action) Use the stains

KNOWLEDGES AND SKILLS

Types of stains
Mathematics of solutions
Technique for making dilutions from stock solutions
Understanding of why some bacteria stain gram positive and others stain gram negative, or acid fast vs. non-acid fast

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Microbiology

MODULE 5: MICROSCOPIC SCREENING OF BACTERIA

- TASKS
- a. Identify bacteria by staining methods
 - b. Stain smears to demonstrate bacteria
 - c. Prepare smears for microscopic analysis
 - d. Prepare stained specimens using cellular stains, e.g. Gram

PERFORMANCE OBJECTIVE

- (Stimulus) When directed by the environmental health officer
(Behavior) The EHA will heat-fix and stain specimen on a glass slide, examine the specimen under a microscope and identify the specimen
(Conditions) With indirect supervision; using a microscope and bacteriologic descriptive key
(Consequence) Determination of the type of microorganisms present in the specimen
(Next Action) Report the results of examination

KNOWLEDGES AND SKILLS

Cellular morphology of bacteria
Bacterial staining reactions
Staining procedures, e.g., Gram, acid-fast
Use and operation of a microscope
Procedures to heat-fix a specimen
Use of bacteriologic descriptive keys
Preparation and cleaning of microscope slides
Preparation of specimens for staining, e.g.,
defatting certain food items, preparing sputum for AFB, etc.
Simple and differential staining methods
Function and operation of microscopic screening equipment, e.g., alcohol lamp, hand propane torch, Bunsen burner

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Microbiology

MODULE 6: DARKFIELD EXAMINATION FOR TREPONEMA PALLIDUM

- TASKS
- a. Prepare chancre specimen for microscopic examination
 - b. Perform darkfield examination

PERFORMANCE OBJECTIVE

- (Behavior) The EHA will prepare a wet mount with sera from lesion and examine immediately by darkfield technique for the presence or absence of typical organisms
- (Conditions) Using darkfield equipment
- (Consequence) Immediate confirmation of diagnosis so that medication can begin if required

KNOWLEDGES AND SKILLS

Cellular morphology of Treponema pallidum
Use and operation of darkfield equipment
Proper handling and disposal of infectious material
Preparation of specimen for microscopic examination
Technique for adjusting darkfield condensor

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Microbiology

MODULE 7: PRELIMINARY IDENTIFICATION OF MEDICALLY IMPORTANT
BACTERIA

- TASKS
- a. Make preliminary identification of bacteria by basic culture techniques
 - b. Make preliminary identification of bacteria by anaerobic methods
 - c. Streak culture media

PERFORMANCE OBJECTIVE

- (Stimulus) When ordered by the environmental health officer or when laboratory services are not available
- (Behavior) The EHA will make a preliminary identification of certain bacteria by aerobic/anaerobic culture methods, i.e., inoculate culture plates or other media with bacterial cultures, incubate the media, make a preliminary identification of bacteria
- (Conditions) With selective supervision; using a sterile inoculating loop
- (Criteria) According to the U.S. Navy Manual on Clinical Bacteriology and Mycology
- (Consequence) Preliminary identification of bacteria
- (Next Action) Report results to environmental health officer

KNOWLEDGES AND SKILLS

Aseptic technique
Nutritional requirements of bacteria
Types of selective and differential media
Incubation temperature requirements
Characteristics of colonial morphology
Aerobic and anaerobic culture procedures
Use and operation of inoculator, Brewer's jar, thermometers
Technique for streaking culture media plates

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Microbiology

MODULE 8: SYPHILIS SCREENING

TASKS a. Do non-treponemal syphilis tests

PERFORMANCE OBJECTIVE

(Stimulus)	Upon receipt of request from environmental health officer for non-treponemal antibody (reagin) testing
(Behavior)	The EHA will perform qualitative and/or quantitative syphilis testing
(Conditions)	With indirect supervision; utilizing appropriate glassware, reagents and properly prepared specimens
(Criteria)	Upon technical review, non-treponemal testing is judged correctly performed with regard to pipetting technique, quality control and utilization of standard testing procedures as set by the National Communicable Disease Center, e.g., calibration of delivery needles
(Consequence)	Results will demonstrate consistently valid testing for syphilis
(Next Action)	Determine if confirmatory treponemal testing is desired by environmental health officer, and report results

KNOWLEDGES AND SKILLS

Specimen preparation
Commercially available reagents
Preparation of controls
Use of equipment, e.g., rotating machine, glass slides with ceramic rings, syringes with calibrated delivery needle
Testing accuracy of delivery needle
Rotation time differences
Reading test results
Use of test kits, e.g., RPR-rapid plasma reagin (circle) card test kits, microflocculation testing kits
Clinical correlation
Normal values
Principle of chemical reactions
Confidential nature of information derived from testing

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Microbiology

MODULE 7: PRELIMINARY IDENTIFICATION OF MEDICALLY IMPORTANT BACTERIA

- TASKS
- a. Make preliminary identification of bacteria by basic culture techniques
 - b. Make preliminary identification of bacteria by anaerobic methods
 - c. Streak culture media

PERFORMANCE OBJECTIVE

- (Stimulus) When ordered by the environmental health officer or when laboratory services are not available
- (Behavior) The EHA will make a preliminary identification of certain bacteria by aerobic/anaerobic culture methods, i.e., inoculate culture plates or other media with bacterial cultures, incubate the media, make a preliminary identification of bacteria
- (Conditions) With selective supervision; using a sterile inoculating loop
- (Criteria) According to the U.S. Navy Manual on Clinical Bacteriology and Mycology
- (Consequence) Preliminary identification of bacteria
- (Next Action) Report results to environmental health officer

KNOWLEDGES AND SKILLS

Aseptic technique
Nutritional requirements of bacteria
Types of selective and differential media
Incubation temperature requirements
Characteristics of colonial morphology
Aerobic and anaerobic culture procedures
Use and operation of inoculator, Brewer's jar, thermometers
Technique for streaking culture media plates

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Microbiology

MODULE 9: WATER POTABILITY TESTING

- TASKS
- a. Do bacterial counts by membrane filtration technique
 - b. Run controls to check accuracy of equipment
 - c. Calculate and prepare percent solutions
 - d. Test water potability by APHA-MPN procedures
 - e. Calculate coliform indices from test results

PERFORMANCE OBJECTIVE

- (Stimulus) After collecting or receiving water specimens
(Behavior) The EHA will perform a bacteriologic examination of the specimen by membrane filtration or M.P.N. technique and calculate coliform indices
(Conditions) Without supervision; using Navy and commercial procedural manuals, hand lens, stereomicroscope, selective culture medium, suction apparatus
(Criteria) Accurately, according to Navy and commercial procedural manuals
(Consequence) Results will produce an assessment of the potability of water
(Next Action) Report results to environmental health officer

KNOWLEDGES AND SKILLS

Sterile technique
Use and maintenance of equipment, e.g., suction apparatus, laboratory incubators, stereomicroscope, magnifier lamp, hand magnifier
Preparation and use of materials, e.g., media
Computation of coliform index
Limitations of membrane filter technique
Principles and techniques of performing membrane filter and M.P.N. procedures
Standards for potable water
Recognition of indicator organisms, e.g., coliform bacteria, fecal strip

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Microbiology

MODULE 10: ENVIRONMENTAL BACTERIAL COUNTS

- TASKS
- a. Do bacterial counts by filtration,
e.g., millipore
 - b. Do bacterial counts by dilution
 - c. Do bacterial counts on hospital equipment
 - d. Do bacterial counts on food/milk
 - e. Do bacterial counts on environmental sample,
e.g., air, soil, swimming pools

PERFORMANCE OBJECTIVE

- (Stimulus) Upon receipt of specimens of food, milk, equipment, air and/or environmental surfaces
- (Behavior) The EHA will perform a bacterial count on the specimen(s) using the appropriate technique, e.g., membrane filter technique, serial dilution, Rodac plates-APHA utensil counts
- (Conditions) With indirect supervision
- (Criteria) According to Navy and commercial bacteriologic procedural manuals
- (Consequence) This action will indicate the degree of bacterial and/or fecal contamination of specimen(s)
- (Next Action) Report results to environmental health officer

KNOWLEDGES AND SKILLS

Aseptic technique
Basic mathematical computations, including dilutions
How to report analysis data
Use and operation of vacuum equipment, colony counters, bacterial counters (Quebec), etc.
Recognition of bacterial colonial morphology on culture plates
Use of bacterial indices

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

COMPETENCY UNIT II: EPIDEMIOLOGY

This unit includes the following Modules:

<u>Number</u>	<u>Title</u>	<u>Page</u>
1	Reportable Diseases	14
2	Investigation of Foodborne or Waterborne Disease Outbreak	15
3	Detection of Human Carriers of Infection	16
4	Diagnostic Testing Procedures	17
5	Immunizations	18
6	Procedures for Preparation of Tuberculin Retesting Annual Report	19
7	Venereal Disease Interviewing.	20
8	Venereal Disease Reporting	21
9	Venereal Disease Education and Prevention. . . .	22
10	Rabies	23

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Epidemiology

MODULE 1: REPORTABLE DISEASES

TASKS a. Collect data on disease incidence
 b. Prepare reports on disease incidence
 c. Transmit reports to appropriate authorities

PERFORMANCE OBJECTIVE

(Behavior) The EHA will collect and record data on disease incidence, classify the diseases and report results
(Criteria) According to the procedures outlined in the APHA guide, Control of Communicable Diseases (11th ed., 1970)
(Consequence) Compliance with legal requirements and compilation of data for the development of effective local, national and/or international disease control programs

KNOWLEDGES AND SKILLS

Diseases that must be reported by law

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Epidemiology

MODULE 2: INVESTIGATION OF FOODBORNE OR WATERBORNE DISEASE
OUTBREAK

TASKS

- a. Collect case histories
- b. Construct a time of onset graph
- c. Construct an attack rate table
- d. Collect food samples for the laboratory
- e. Collect stool and/or vomitus samples from patients for laboratory

PERFORMANCE OBJECTIVE

(Stimulus)	In the event of an outbreak of foodborne disease
(Behavior)	The EHA will initiate and carry out the epidemiologic procedures to identify the cause of disease, mode of spread and probable reservoir of infection; and complete appropriate report forms
(Conditions)	Without supervision
(Criteria)	According to procedures outlined in <i>The Investigation of Foodborne Disease Outbreaks</i> (2nd ed., 1966, International Association of Milk, Food and Environmental Sanitarians, Inc.)
(Consequence)	This procedure will determine the source of the epidemic so that steps can be taken to prevent similar outbreaks in the future

KNOWLEDGES AND SKILLS

- Types of infectious food poisonings
- Types of chemical food poisonings
- Incubation periods for various foodborne infections or poisonings
- Common reservoirs of the various foodborne infections
- Principles and techniques for collecting, preparing and shipping material (samples) to laboratory for inspection
- Construction of time of onset graph
- Technique for interpreting time of onset graph to determine contaminated meal
- Survey techniques
- Patient interviewing techniques
- Record keeping on standard questionnaires
- Selection of samples to be collected
- Preparation of attack rate table
- Principles and techniques of data analysis
- Remedial procedures

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Epidemiology

MODULE 3: DETECTION OF HUMAN CARRIERS OF INFECTION

- TASKS
- a. Collect throat and nasal swabbings for culture
 - b. Collect fecal and urine samples for culture and microscopic examination
 - c. Collect exudate from lesions for culture
 - d. Forward samples to laboratory for isolation and typing of pathogens

PERFORMANCE OBJECTIVE

- (Behavior) The EHA will take samples from apparently healthy and from **recovered patients**
- (Conditions) With direct supervision
- (Criteria) According to procedures in the APHA guide, **Control of Communicable Diseases (11th ed., 1970)**
- (Consequence) This procedure will determine if those examined are in a carrier state for various pathogens; locate sources of infection; provide for treatment of carriers and lower the disease incidence of base personnel

KNOWLEDGES AND SKILLS

Use of APHA guide, Control of Communicable Diseases

Procedures for preservation and shipping of samples to laboratory

Recognition that healthy-appearing individuals can be **carriers**

Theory and use of pathogen typing

Aseptic technique

Technique and procedures for collecting nose and throat swabbings

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Epidemiology

MODULE 4: DIAGNOSTIC TESTING PROCEDURES

- TASKS
- a. Perform skin test, e.g., Dick, Schick, **tuberculin**
 - b. Read results of test
 - c. Perform venipuncture
 - d. Ship properly labeled blood specimen to laboratory for serologic testing

PERFORMANCE OBJECTIVE

- (Behavior) The EHA will perform the appropriate skin tests, e.g., Dick, Schick, **tuberculin**, etc.; read the test results and when indicated perform venipuncture and ship blood specimens to laboratory for serologic testing
- (Conditions) With supervision
- (Next Action) Refer personnel with positive reactions for follow-up studies or immunizations, if appropriate

KNOWLEDGES AND SKILLS

Technique for accurate reading of skin tests
Principles of skin tests
Techniques for administering skin tests
Principles of serologic tests
Aseptic technique
Reasons for false-positive and false-negative **reactions to these tests**
Principles and procedures for administration of **intradermal injections**
Principles and procedures of venipuncture
Principles and techniques of accurate record keeping

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Epidemiology

MODULE 5: IMMUNIZATIONS

TASKS a. Conduct and administer immunization programs
 b. Maintain jet hypodermic injection apparatus

PERFORMANCE OBJECTIVE

(Behavior) The EHA will conduct and administer immunization programs by various methods (oral or intramuscular or subcutaneous injection) as indicated
(Conditions) With supervision; using glass and plastic syringes, needles, jet hypodermic injection apparatus, antigen
(Consequence) Personnel receive immunizations necessary to protect them from disease
(Next Action) Record personnel immunizations in the health records

KNOWLEDGES AND SKILLS

Types of immunizations
Proper methods and technique for administering immunizations
Preservation and storage of antigen
Recognition of symptoms of anaphylactic shock
Intervals for booster shots
Exemptions from immunizations
Procedures and techniques for organizing immunization programs
Preparation, sterilization, use and maintenance of immunization equipment, e.g., jet hypodermic apparatus, glass and plastic syringes, needles
Use of metric measurements
Emergency treatment for anaphylactic shock

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Epidemiology

MODULE 6: PROCEDURES FOR PREPARATION OF TUBERCULIN RETESTING
ANNUAL REPORT

- TASKS
- a. Obtain medical histories
 - b. Obtain patient social and family history
 - c. Prepare reports for transmittal to other commands
 - d. Draft official correspondence

PERFORMANCE OBJECTIVE

- (Stimulus) Upon completion of the annual tuberculin skin testing program
- (Behavior) The EHA will complete the epidemiologic procedures and prepare and submit an Annual Report of Tuberculin Retesting (NavMed 6224.2)
- (Conditions) Without supervision
- (Criteria) The report must contain information concerning incidence of tuberculosis and be submitted prior to January 31 of each year
- (Consequence) Statistical data regarding tuberculosis will be compiled for study

KNOWLEDGES AND SKILLS

Various health record forms
Forms required for submission of data
Techniques for preparation and submission of written correspondence
Principles and techniques for compiling statistical data
Typing skills

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Epidemiology

MODULE 7: VENEREAL DISEASE INTERVIEWING

- TASKS
- a. Obtain medical histories for epidemiologic report
 - b. Interview VD patient
 - c. Obtain patient social and family history

PERFORMANCE OBJECTIVE

- (Stimulus) When confronted with a patient with a confirmed venereal disease report
- (Behavior) The EHA will conduct a venereal disease epidemiologic interview
- (Conditions) In private, without supervision; using the DOD Venereal Disease Interviewer's Guide as a reference
- (Criteria) Complete and accurate information obtained regarding the patient's social and family history with particular attention to his sexual patterns and contacts
- (Consequence) Information on sources of venereal disease infection will be obtained for tracing and treatment
- (Next Action) Record appropriate information on necessary report forms

KNOWLEDGES AND SKILLS

How to communicate with apprehensive patients
How to interpret written instructions
Types of venereal diseases and their etiology
Venereal disease interviewing techniques
Ability to prepare written reports
Ability to control the interview
Ability to talk on the level of the interviewee
Ability to establish rapport with the interviewee

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Epidemiology

MODULE 8: VENEREAL DISEASE REPORTING

- TASKS
- a. Prepare reports for transmittal to other commands
 - b. Complete report forms on VD contact
 - c. Draft official correspondence

PERFORMANCE OBJECTIVE

- (Stimulus) Following a venereal disease interview
(Behavior) The EHA will complete the Venereal Disease Epidemiological Reports (USPHS Form 2683), transcribing all available information on identity, description and location of sexual contacts mentioned
(Conditions) Without supervision; using a separate USPHS Form 2683 for each contact
(Criteria) According to current U.S. Naval directives
(Consequence) The sexual contacts of the patient are located and treated
(Next Action) Submit completed epidemiologic report to the appropriate civilian and military health agencies

KNOWLEDGES AND SKILLS

Procedures for preparation of USPHS Form 2683
Where to send completed forms
Techniques for communicating effectively in writing, and drafting written reports

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Epidemiology

MODULE 9: VENEREAL DISEASE EDUCATION AND PREVENTION

- TASKS
- a. Explain/answer questions about VD
 - b. Recommend and give patient and family supplemental health training material
 - c. Coordinate with other health agencies regarding health matters
 - d. Lecture/orient personnel on VD and other social diseases

PERFORMANCE OBJECTIVE

- (Behavior) The EHA will conduct formal classes for Navv personnel on the control and prevention of venereal disease and will answer questions about venereal and other social diseases. If necessary the classes may include civilian personnel
- (Conditions) Without supervision; using designated instructional materials
- (Criteria) In accordance with current policies set forth in SecNavInst 6222.1C UCMJ articles 125 and 134
- (Consequence) Naval personnel are made aware of methods of prevention of venereal disease thus lowering the venereal disease morbidity rate among personnel

KNOWLEDGES AND SKILLS

Etiologic agents and symptoms of venereal diseases
How to prepare lesson plans
Methods of prevention and control of venereal disease
Venereal disease statistics and their use
Use of audiovisual aids
Anatomy and physiology of the male and female reproductive systems
Principles and techniques of speaking to large groups
Interpretation of written directives

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Epidemiology

MODULE 10: RABIES

- TASKS
- a. Bait/trap animals for rabies control program
 - b. Conduct/supervise rabies protection program
 - c. Review and evaluate animal/insect bite incident reports
 - d. Explain/answer patient's questions regarding symptoms/disease/treatment
 - e. Assist in operation of rabies control board
 - f. Preserve animal brains/heads for rabies studies
 - g. Quarantine and observe animals suspected of rabies
 - h. Recommend action to be taken on suspected EDI problem
 - i. Set up and review record keeping and control of domestic animal inoculations
 - j. Instruct personnel on action to be taken following animal/insect bite
 - k. Notify health authorities of animal bite incidents

PERFORMANCE OBJECTIVE

- (Stimulus) Upon orders from the commanding officer
(Behavior) The EHA will initiate and maintain a program for rabies control and prevention, including supervising the trapping and quarantine of animals when the possibility of rabies exists; preserving and forwarding animal heads and brains to appropriate civilian and military laboratories to determine the presence of Negri bodies; noting and recording all incidents of animal bites; arranging for animal immunizations; and if called upon, serving on the rabies control board
(Criteria) According to pertinent U.S. Navy directives and civil codes
(Consequence) As a result of this action the possibility of rabies will be reduced

KNOWLEDGES AND SKILLS

How to trap animals
Etiology and symptoms of rabies
Treatment of rabies

MODULE 10 (Continued)

How to preserve animal heads for study
Recognition that bats and skunks are primary
reservoirs of infection

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

COMPETENCY UNIT III: PUBLIC HEALTH STATISTICS

This unit includes the following Modules:

<u>Number</u>	<u>Title</u>	<u>Page</u>
1	Compilation of Vital Statistics	26
2	Presentation of Data	27
3	Collection of Data on a Selected Sample	28

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Public Health Statistics

MODULE 1: COMPILATION OF VITAL STATISTICS

- TASKS:
- a. Maintain records of reportable diseases
 - b. Calculate observed rates
 - c. Calculate theoretical rates for comparisons as to significance
 - d. Use index numbers, e.g., coliform index

PERFORMANCE OBJECTIVE

- (Stimulus) According to established routine schedule
- (Behavior) The EHA will maintain complete records of reportable diseases and calculate crude and adjusted rates of disease incidence
- (Conditions) Using calculator or slide rule, and established formulae
- (Criteria) Diseases must be classified according to APHA Manual, Control of Communicable Diseases (1971), and mathematical calculations accurately performed
- (Consequence) This action will aid in discovering problems and provide information for determining what preventive measures should be instituted
- (Next Action) Graph data

KNOWLEDGES AND SKILLS

Classification of diseases as set up by C.D.C. of U.S. Public Health Service

Use and operation of calculator and slide rule

Procedures for computing standard error for a rate

Mathematical procedures for computing rates, ratio and percentages

Type and amount of data in files, census, etc.

Procedures for setting up and retrieving data from files

When and how to adjust rates, e.g., for race, age and location

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Public Health Statistics

MODULE 2: PRESENTATION OF DATA

TASKS: a. Construct tables
 b. Construct graphs

PERFORMANCE OBJECTIVE

(Stimulus)	Periodically, as part of reporting procedures
(Behavior)	The EHA will transfer compiled data into tables and graphs
(Conditions)	With supervision; using specified graph paper and graphing techniques
(Criteria)	Numerical data are accurately converted to relative proportions when graphing, or accurately copied into tables. Consistency of number of decimals used within the same table is essential
(Consequence)	This action will permit better visual interpretation of accumulated data and can provide a tool for the health education of the group under study
(Next Action)	Review of tables/graphs for typos, visual clarity, consistency

KNOWLEDGES AND SKILLS

Types of charts and tables
Techniques for construction of charts and tables
Discrete data vs. grouped data
Classification of data
Types of graphs, e.g., line, bar, pie
Techniques for constructing graphs
Relevant basic mathematics
Use of various types of graph paper
Accuracy in drawing

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Public Health Statistics

MODULE 3: COLLECTION OF DATA ON A SELECTED SAMPLE

- TASKS:
- a. Select a sample from the larger group which is to be studied
 - b. Collect data on selected sample

PERFORMANCE OBJECTIVE

- | | |
|---------------|--|
| (Stimulus) | When it is desirable to determine a characteristic of a group or evaluate a program designed for a group through study of a smaller group |
| (Behavior) | The EHA will select a sample study group and collect data from existing records or through prepared questionnaires |
| (Conditions) | With supervision and following a prepared sample design |
| (Criteria) | Personal bias or opinion should not enter into the selection of individuals to be included in the sample, nor in the questions that are asked of respondents |
| (Consequence) | This action will provide data which can lead to an evaluation of a current program or indicate the need for a new program |

KNOWLEDGES AND SKILLS

Methods of sampling, e.g., random, systematic, random numbers technique
Recognition of bias in a sampling
Data retrieval techniques
Procedures for constructing proper questionnaires

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

COMPETENCY UNIT IV: RODENTS

This unit includes the following Modules:

<u>Number</u>	<u>Title</u>	<u>Page</u>
1	Rodent Survey	30
2	Rodent Control	32

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Rodents

MODULE 1: RODENT SURVEY

- TASKS
- a. Inspect spaces for rodent infestation
 - b. Do live trapping of rodents
 - c. Check animal for presence of ectoparasite
 - d. Conduct surveys of shipboard disease vectors
 - e. Do quarantine inspection of vessels
 - f. Conduct ship deratization exemption inspection
 - g. Identify genus and species of animals
 - h. Conduct/supervise vector control survey
 - i. Inspect and certify retrograde cargo
 - j. Prepare and ship rodent specimens

PERFORMANCE OBJECTIVE

- (Stimulus) When scheduled (e.g., shipboard deratization inspection, shipboard deratization exemption inspection) or upon reported, suspected or observed presence of rodents in an area
- (Behavior) The EHA will conduct a rodent survey, and determine the extent of rodent infestation. All rodents captured during the survey will be identified as to genus and species and their ectoparasites removed and identified
- (Conditions) Using appropriate equipment, e.g., tracking patches, live traps, ultraviolet lights
- (Criteria) According to the Manual of Naval Preventive Medicine (NavMed P5010) and the USPHS Center for Disease Control Booklet on Rodent Control
- (Consequence) **Information for determining if a rodent problem exists in a given area**
- (Next Action) Initiate a rodent control program

KNOWLEDGES AND SKILLS

Recognition of signs of rodent infestation,
e.g., droppings, hairs, rubbings, gnawings
Rodent and ectoparasite life cycles, habitats
and behavior
Survey techniques for rodents and ectoparasites
Techniques for rodent inspection on ship
Internal quarantine regulations that apply to
rodents on ships
U.S. Navy General Order 20
Knowledge of rodent-borne disease

MODULE 1 (Continued)

Rodent population dynamics
Use of survey equipment, e.g., tracking patches,
live traps, ultraviolet light
Use of biologic identification keys to identify
rodents

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Rodents

MODULE 2: RODENT CONTROL

- TASKS
- a. Do ectoparasite extermination
 - b. Do rodent extermination
 - c. Select type of pesticide to be used for extermination
 - d. Prepare rodenticides and insecticides for use
 - e. Perform fumigation procedures
 - f. Consult on rodent proofing of buildings
 - g. Provide advice on vector/rodent control
 - h. Teach personnel use and handling of pesticides
 - i. Safeguard poisons
 - j. Evaluate results of control measure

PERFORMANCE OBJECTIVE

- (Stimulus) When a rodent survey has indicated a need
(Behavior) The EHA will institute a rodent control program after the area has been treated with pesticides/insecticides for the control of rodent ectoparasites; the EHS will consult with construction and maintenance personnel on rodent proofing buildings ashore and will provide advice on rodent control aboard ship
- (Conditions) With limited supervision; using wooden rat traps and poison bait, pesticides
- (Consequence) Minimized threat of disease from rodents or rodent ectoparasites
- (Next Action) Maintain a schedule of routine rodent surveys to check that rodents do not repopulate an area where eradication has been successfully carried out

KNOWLEDGES AND SKILLS

Rodent and ectoparasite behavior, habitat and life cycles
Types of rodent-borne diseases
Awareness of rodenticide safety procedures and uses
Rodent control procedures (e.g., Handbook of Pest Control, by Mallis)
Fumigation practices
Pesticide formulation procedures for rodents and ectoparasites
Rodent population dynamics

MODULE 2 (Continued)

Ectoparasite control procedures in a rodent-
infested area

Construction of bait stations

Placement of traps to take advantage of rodent
behavioral patterns

Preparation (formulation, mixing and placement)
of rodenticide baits

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

COMPETENCY UNIT V: MEDICAL ENTOMOLOGY AND PEST CONTROL
TECHNOLOGY

This unit includes the following Modules:

<u>Number</u>	<u>Title</u>	<u>Page</u>
1	Arthropod Survey	35
2	Arthropod Identification	37
3	Pesticide Handling and Safety	38
4	Pesticide Formulation and Calculations	40
5	Indoor Pesticide Dispersal	41
6	Outdoor Pesticide Dispersal	42
7	Entomologic Laboratory Techniques	43
8	Entomologic Rearing Techniques	44

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Entomology and Pest Control Technology

MODULE 1: ARTHROPOD SURVEY

- TASKS
- a. Inspect living, working and storage spaces for insect infestation
 - b. Inspect food for pest infestation
 - c. Inspect spaces for ectoparasite infestation
 - d. Survey area to determine extent of pest infestation
 - e. Collect insect specimens
 - f. Prepare and ship insect specimens

PERFORMANCE OBJECTIVE

- (Stimulus) As scheduled or upon reported, suspected or observed presence of arthropods in an area
- (Behavior) The EHA will conduct an arthropod survey in the area; collect insect specimens and record locations of collections on a map, prepare and ship the specimens to a laboratory
- (Conditions) With limited supervision; using entomologic survey kit equipment, e.g., light traps, bait traps, insect sweep nets, fly counting grids, tick drag cloths, dippers, berlese funnels, maps
- (Consequence) The environmental health department will obtain information regarding the presence, density and location of arthropods of medical importance
- (Next Action) Send collected specimens to the laboratory for identification

KNOWLEDGES AND SKILLS

Life cycles, habitats and behavior of arthropods
Public health importance of arthropods
Survey methods of adult arthropods
Methods of surveying immature arthropods
Standard labeling procedures for biologic specimens, e.g., with date, habitat, location, collector's name
Basic map reading and standard survey site recording symbols as listed in the Naval Surveillance Manual (EPNV-2)
Arthropod population dynamics
Use of survey tools, e.g., entomologic survey kit, light traps, insect net, fly counting grid, tick drag, maps, cone fly traps, berlese funnels, bait traps

MODULE 1 (Continued)

Ability to utilize knowledge of arthropod life
cycles, habitats and behavior
How to prepare and ship insect specimens to
laboratory

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Entomology and Pest Control Technology

MODULE 2: ARTHROPOD IDENTIFICATION

- TASKS
- a. Identify parasitic and disease carrying arthropods
 - b. Determine kind of pest infestation
 - c. Identify genus and species of arthropods

PERFORMANCE OBJECTIVE

- (Stimulus) Upon receipt of specimen collected in the survey
(Behavior) The EHA will identify the specimen
(Conditions) With limited supervision; using a stereomicroscope, compound microscope, hand lens, biologic identification keys
(Consequence) Information produced for determining if a vector-borne disease threat exists
(Next Action) Treat the survey area with pesticides or by integrated pest control methods if necessary

KNOWLEDGES AND SKILLS

Arthropod morphology and taxonomy
Use of taxonomic keys
Use of optical magnification equipment; e.g., dissecting microscope
Use of dissecting instruments in manipulating minute specimens
Arthropod population dynamics

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Entomology and Pest Control Technology

MODULE 3: PESTICIDE HANDLING AND SAFETY

- TASKS
- a. Safeguard poisons
 - b. Inspect for use of protective clothing in occupationally hazardous areas
 - c. Conduct surveys on misuse of toxic materials

PERFORMANCE OBJECTIVE

- (Stimulus) When required to use pesticides
(Behavior) The EHA will ensure that all pesticides are being handled and applied safely, i.e., select necessary and appropriate safety equipment, insure that pesticides are stored in proper containers under lock and key, handled and mixed in clean, **ventilated areas that can be locked** when not in use; dispose or supervise proper disposition of waste or excess pesticides; and insure that all personnel who handle or apply pesticides that cause a reduction of the enzyme cholinesterase are given routine physical examinations as required by BuMed Instructions and Navy Civilian Personnel Instructions
- (Conditions) With minimal supervision; using safety equipment, e.g., pesticide resistant clothing, **respirators** equipped with proper filter pads, gas masks, airline masks
- (Criteria) Observing all federal, state and governmental agencies' regulations; disposition of waste or excess pesticides according to current regulations of the Environmental Protection Agency (EPA), the Navy Manual of Preventive Medicine (NavMed P5010), Military Entomology Operational Handbook (NavDocks MO-310) and other current instructions
- (Consequence) **Pesticides will be applied so as not to cause any adverse effect on the applicator, environment or nontarget living organisms**

KNOWLEDGES AND SKILLS

Pesticide regulations of EPA/USDA/DOD
Pesticide toxicity (LD₅₀ acute oral and dermal levels)
Pesticide safety procedures for application and handling

MODULE 3 (Continued)

Physical examinations and laboratory tests
required for pesticide applicators
Use of safety equipment required when handling/
mixing/applying pesticides
Pesticide Toxicity (EC₅₀ median effective
concentration)
PPM, pph, mg/kg, ug
Procedures for inspecting pesticide storage areas
Instructional techniques for demonstrating proper
use of protective devices and pesticides to all
users and handlers of pesticides
Record-keeping procedures re pesticides ordered,
received, expended and on hand

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Entomology and Pest Control Technology

MODULE 4: PESTICIDE FORMULATION AND CALCULATIONS

- TASKS
- a. Select type of pesticide to be used for extermination
 - b. Calculate amount of pesticide for use in specific areas
 - c. Weigh and measure chemical
 - d. Calculate and prepare percent solutions
 - e. Teach personnel use and handling of pesticides

PERFORMANCE OBJECTIVE

- (Stimulus) When the results of vector survey indicate the need for chemical control
- (Behavior) The EHA will calculate and formulate pesticides in the proper concentration for use
- (Conditions) With limited supervision
- (Criteria) According to Federal regulations (e.g., Environmental Protection Agency rules); formula for the pesticide prepared to the exact percent solution or emulsion required
- (Consequence) A pesticide is produced in correct form and concentration to exterminate the vector and reduce the threat of disease
- (Next Action) Apply pesticide

KNOWLEDGES AND SKILLS

Selection of pesticides
Pesticide use regulations (EPA)
Use of weights and measures
Use and interpretation of formulae, tables, nomographs and calculating devices
Interpretation of related laws and legal regulations
Use of manuals, catalogues
Vector control requirements as stated in BuMed Instructions 6250.12

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Entomology and Pest Control Technology

MODULE 5: INDOOR PESTICIDE DISPEPSAL

- TASKS
- a. Do bedbug extermination
 - b. Do roach/ant/kitchen pest extermination
 - c. Spray infested areas

PERFORMANCE OBJECTIVE

- (Stimulus) When an arthropod survey indicates the need for pesticide application indoors
- (Behavior) The EHA will apply pesticide in the area either covering all surfaces or applying the pesticide as spot treatment according to the vector/pest/arthropod infesting the area
- (Conditions) With limited supervision
- (Criteria) Application of the exact amount of pesticide as directed by EPA labels and Navy DVECC Manuals to minimize risk of adverse effect on applicator, other humans or nontarget organisms
- (Consequence) Control of arthropods considered to be disease vectors or economic pests
- (Next Action) After allowing time for the pesticide to have its effect, conduct another survey to evaluate the effectiveness of the pesticide

KNOWLEDGES AND SKILLS

Pesticide characteristics; e.g., oral and dermal toxicity, persistence, compatability, solubility

Restrictions and regulations of pesticide use

Life cycles, habitat and behavior of insects

Pesticide safety (protective clothing, disposal of unused pesticide, proper cleaning of equipment after use)

First aid measures in case of pesticide poisoning

How to calculate pesticide dosage

Selection and use of appropriate equipment

Vector control requirements as stated in BuMed Instructions 6250.12

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Entomology and Pest Control Technology

Module 6: OUTDOOR PESTICIDE DISPERSAL

- TASKS
- a. Take measurement readings of air and wind movements
 - b. Fog area with pesticide/insecticide

PERFORMANCE OBJECTIVE

- (Stimulus) When an arthropod survey indicates the need for control of arthropods in an outdoor area
- (Behavior) The EHA will apply pesticide in the area after measuring air movements (wind speed and direction), temperature and humidity
- (Conditions) With limited supervision
- (Criteria) Dispersal of the pesticide at the exact rate specified by the manufacturer's instructions and EPA regulations to minimize any adverse effects on the applicator, the environment or nontarget organisms in the area
- (Consequence) Control of arthropods that are considered to be disease vectors or economic pests
- (Next Action) After allowing time for the pesticide to have its effect, conduct a survey to determine the effectiveness of the pesticide

KNOWLEDGES AND SKILLS

Meteorologic techniques to measure wind speed and direction, temperature and humidity

Characteristics of pesticides, e.g., oral and dermal toxicity, compatability, solubility, persistence

Physics of pesticide dispersal (behavior of droplets, deposit rates of droplets)

Operation and mechanics of dispersal equipment

Regulations and restrictions on pesticide use

Recognition and evaluation of ecologic impact of pesticide usage

Life cycles, habitat and behavior of insects

Pesticide safety (protective clothing, disposal of unused pesticides, proper cleaning of equipment)

Safety in equipment operation

First aid measure to be applied in case of pesticide poisoning

Calculation of pesticide dosage rate

Operation of meteorologic equipment

Vector control requirements according to BuMed Instructions 6250.12

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Entomology and Pest Control Technology

MODULE 7: ENTOMOLOGIC LABORATORY TECHNIQUES

- TASKS
- a. Do mosquito dissection to determine infection by malarial parasites
 - b. Recover oocyst from infected mosquitoes
 - c. Prepare stained specimens using cellular stains, e.g., Gram

PERFORMANCE OBJECTIVE

- (Stimulus) Upon request from the environmental health officer
- (Behavior) The EHA will dissect insects and remove organs or body regions where parasites are normally found
- (Conditions) With supervision; using a microscope, dissecting instruments (e.g., microscope, forceps)
- (Criteria) The insect organs (e.g., salivary glands, stomach) removed intact so that the organs can be stained and observed under the microscope
- (Consequence) Information for determining if the insect is capable of transmitting disease organisms
- (Next Action) Advise the environmental health officer of findings

KNOWLEDGES AND SKILLS

Insect anatomy, external and internal
Life cycles of vector-borne disease organisms
(e.g., malaria)
Microdissection techniques
Staining techniques
Use of microscopes
Identification of insects by genus and species
Use of biologic keys

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Entomology and Pest Control Technology

MODULE 3: ENTOMOLOGIC REARING TECHNIQUES

TASKS a. Maintain an insectary

PERFORMANCE OBJECTIVE

(Stimulus)	When ordered by the environmental health officer
(Behavior)	The EHA will establish and maintain an insectary
(Conditions)	With technical assistance; using thermometers, humidifiers
(Criteria)	In accordance with standard texts (e.g., Mass Rearing and Colonization of Insects, by Smith); with a controlled humidity and temperature ideal for rearing large numbers of insects
(Consequence)	Will make available large numbers of insects for experimental purposes, e.g., insecticide resistance determination studies
(Next Action)	Use the specimens for study

KNOWLEDGES AND SKILLS

Mass rearing techniques: food, habitat, light
Temperature regulation techniques
Temperature measurements
Regulation of humidity
Measurement of humidity
Insect/environment relationships
Safety procedures
Making cages
Preparation and caring for animals used for arthropod feeding
Prevention of arthropod escape from insectary
Use and operation of related equipment, e.g., humidifiers, thermometers
Reading and recording data, e.g., temperature, humidity, light periods
Preparation of appropriate body areas of animals and humane restraint techniques for arthropod feeding

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

COMPETENCY UNIT VI: MEDICAL PARASITOLOGY

This unit includes the following Modules:

<u>Number</u>	<u>Title</u>	<u>Page</u>
1	Survey and Collection of Parasite Specimens	46
2	Preparation of Specimens	47
3	Identification of Parasites	48

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Parasitology

MODULE 1: SURVEY AND COLLECTION OF PARASITE SPECIMENS

- TASKS
- a. Conduct/supervise water area infestation surveys, e.g., snails, mosquitoes
 - b. Take food/water samples for bacteria parasite test
 - c. Collect specimens, e.g., blood, feces, for parasite test

PERFORMANCE OBJECTIVE

- (Stimulus) When ordered by the environmental health officer
(Behavior) The EHA will conduct a parasite survey; collect specimens (e.g., food, water, blood, stool); prepare and send the specimens to the laboratory
(Conditions) Without supervision
(Consequence) Proper specimens sent to the laboratory for identification
(Next Action) Preparation of specimens for laboratory examination

KNOWLEDGES AND SKILLS

- How to handle parasite specimens
- How to select, preserve and label specimens
- Postal regulations on sending specimens through the mail
- Charting and recording skills
- Principles and techniques for conducting parasite surveys

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Parasitology

MODULE 2: PREPARATION OF SPECIMENS

TASKS	a. Prepare blood film on slide b. Emulsify feces for testing c. Prepare special stains
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PERFORMANCE OBJECTIVE

(Stimulus)	After collecting specimens for laboratory examination
(Behavior)	The EHA will prepare the specimens for examination, e.g., prepare thick and thin blood slides for the confirmation of malaria and other blood and tissue parasites; prepare special stains (e.g., MIF stain) for protozoan identification
(Conditions)	Without supervision
(Next Action)	Identification of the parasite using prepared specimens

KNOWLEDGES AND SKILLS

Safety in handling specimens
Staining techniques
Preparation of thick and thin smears
Preparation of special stains, e.g., MIF stain

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Parasitology

MODULE 3: IDENTIFICATION OF PARASITES

TASKS	a. Identify cestodes, nematodes or trematodes
	b. Identify genus and species of animals
	c. Identify protozoa
	d. Identify amoeba

PERFORMANCE OBJECTIVE

(Stimulus)	After parasite specimens have been prepared for laboratory examination
(Behavior)	The EHA will identify parasites of medical importance by genus and species
(Conditions)	Without supervision; using stereo- and operating microscopes, identification keys found in Naval Manual of Medical Protozoology and Helminthology
(Criteria)	Accurate identification
(Consequence)	Identification of parasites of medical importance

KNOWLEDGES AND SKILLS

Morphology and biology of parasites
Taxonomy of parasites
Use of stereo- and operating microscopes
Use of identification keys

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

COMPETENCY UNIT VII: FOOD SANITATION

This unit includes the following Modules:

<u>Number</u>	<u>Title</u>	<u>Page</u>
1	Inspection of Food Service Personnel	50
2	Inspection of Food Service Facilities	51
3	Inspection of Food Products	53
4	Food Service Training	55

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Food Sanitation

MODULE 1: INSPECTION OF FOOD SERVICE PERSONNEL

TASKS a. Inspect catering operations and personnel
 b. Inspect food handlers for cleanliness
 and proper attire
 c. Review histories and physicals of personnel

PERFORMANCE OBJECTIVE

(Stimulus) Upon order of the environmental health officer
(Behavior) The EHA will inspect all food service personnel
 in the galley or areas where food handlers are
 stationed
(Conditions) Without supervision
(Criteria) Food handling personnel must meet physical stan-
 dards set out in the Manual of Naval Preventive
 Medicine (NavMed P5010), be clean and neat in
 attire and have no open sores or wounds that
 could spread contaminants
(Consequence) This action will determine whether food service
 personnel are fit for performing food service
 duties
(Next Action) Report results

KNOWLEDGES AND SKILLS

Physical standards for food service personnel
Symptoms of various communicable diseases
Good hygiene practices
Recognition of personnel who may be potential
 health hazards

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Food Sanitation

MODULE 2: INSPECTION OF FOOD SERVICE FACILITIES

- TASKS
- a. Inspect spaces for cleanliness
 - b. Inspect bakeries for hygienic conditions
 - c. Inspect dairy products packaging and storage facilities
 - d. Inspect working areas to ensure they meet sanitary standards
 - e. Inspect food storage facilities for required temperature control
 - f. Inspect toilets and washrooms
 - g. Inspect kitchens for cleanliness
 - h. Inspect for health hazards in kitchens
 - i. Inspect mobile canteens
 - j. Inspect vending machines
 - k. Inspect civilian messing areas
 - l. Inspect indigenous eating and drinking facilities
 - m. Inspect coffee mess/dining room
 - n. Inspect spaces for insect infestation
 - o. Inspect spaces for rodent infestation
 - p. Inspect dishwashing procedures
 - q. Inspect any food preparation/service area
 - r. Inspect for adequate handwashing facilities
 - s. Inspect waste storage and disposal area
 - t. Inspect structure, i.e., floors, walls, ceilings, for good repair, ease of cleaning, preventive measures against insects and rodents, adequacy of lighting, plumbing, ventilation

PERFORMANCE OBJECTIVE

- | | |
|---------------|--|
| (Stimulus) | At the request of the environmental health officer |
| (Behavior) | The EHA will inspect pertinent food service areas |
| (Criteria) | Food service areas must meet standards set forth in the Manual of Naval Preventive Medicine (NavMed P5010) e.g., be clean, free from vermin, in satisfactory operation, in an overall sanitary condition and free of potential health and/or safety/fire hazards |
| (Consequence) | A determination of whether the food service preparation facilities meet prescribed sanitary standards |
| (Next Action) | Correct any discrepancies found |

APPENDIX 2 (Continued)

KNOWLEDGES AND SKILLS

Standards for food service areas and equipment
Equipment used for refrigeration and the temperatures required
Dairy sanitation from source to consumer
Methods of food preservation
Methods of food storage and factors affecting spoilage of foods
Special precautions in storage, preparation and serving of food and drink
Detergents and sanitizers
Design criteria for food service facilities, equipment and utensils
Agents involved in food-borne illnesses
Techniques and principles of reading and calibrating thermometers
Procedures for conversion between Fahrenheit and Centigrade scales
Principles and techniques for disassembling and reassembling various pieces of food service equipment, e.g., dishwasher
Use of ultraviolet light as an inspection tool
Procedures to determine volumetric dimensions of food service operation
Safe and effective methods of rodent and insect control in a food service operation
Use of a sling psychrometer in humidity determinations
Recognition of existing and potential cross-connections, back siphonage, submerged inlets in the plumbing
Standards set by BuSanda, BuShips, BuDocks, F.D.A., USPHS and U.S. Department of Agriculture
Recognition of safety hazards (fire, electrical, falls, etc.)
Procedures for determination of sanitary efficiency of liquid and/or solid waste disposal
Procedures for determination of effectiveness of bactericidal treatment

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Food Sanitation

MODULE 3: INSPECTION OF FOOD PRODUCTS

- TASKS
- a. Determine if food is fit/unfit for human consumption
 - b. Do smell and taste tests on milk
 - c. Inspect fresh produce
 - d. Provide advice on food edibility/water potability
 - e. Treat fresh fruits and vegetables suspected of bacterial/parasite contamination

PERFORMANCE OBJECTIVE

- (Stimulus) Upon orders of environmental health officer
(Behavior) The EHA will inspect all subsistence items in food service areas
(Conditions) Using a thermometer
(Criteria) According to Navy standards and the Manual of Naval Preventive Medicine (NavMed P5010)
(Consequence) By this action it will be determined whether food items are fit or unfit for human consumption

KNOWLEDGES AND SKILLS

Food standards for freshness and potability
What food items are most likely to spoil easily
Required temperature for the various items
How stock is rotated
Microorganisms important in food microbiology
Principles of food preservation
Principles of food spoilage
Recognition of food spoilage
Principles of food storage, including time-temperature relationships
Agents involved in food-borne illnesses
Reservoirs of disease-producing agents
Primary and secondary sources of food contaminants
Multiplication of bacterial food contaminants
Principles and techniques for performing various examinations, e.g., for the presence of adulterants, for spoilage, organoleptic examination, microbiologic examinations to ascertain degree of chemical disinfection given certain foods

MODULE 3 (Continued)

Use of ultraviolet light as an inspection tool
Collection, preservation and shipment techniques
for samples to be sent for laboratory testing
Techniques for communication with food service
personnel

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Food Sanitation

MODULE 4: FOOD SERVICE TRAINING

- TASKS
- a. Provide advice on improving hygienic conditions
 - b. Provide advice on food edibility/ water potability
 - c. Instruct food service personnel on food sanitation and handling procedures
 - d. Instruct food service personnel on fire and safety hazards

PERFORMANCE OBJECTIVE

- (Stimulus) Upon orders from the environmental health officer
(Behavior) The EHA will conduct classroom instruction in food handling for civilian and military food service personnel
(Conditions) Without supervision; using films relating to hygiene and sanitation as lecture aids
(Criteria) According to standards prescribed in the Naval Manual of Preventive Medicine (NavMed P5010)
(Consequence) Food service personnel are informed of their obligations as food handlers and of the hazards of food-borne disease
(Next Action) Personnel attending the lectures receive the required certification as trained food service workers

KNOWLEDGES AND SKILLS

Required frequency for food service training
Navy standards for food service personnel
Principles of preservation, preparation, storage and service of food
Principles of spoilage and contamination of food
Personal hygiene practices
Operational aspects of food service concentrating on health hazard-prone areas
Fire and safety hazards and precautions related to food service
Instructional skills
Preparation of lesson plans
Group communication techniques
Use and operation of audiovisual equipment
Course evaluation techniques

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

COMPETENCY UNIT VIII: WATER SANITATION

This unit includes the following Modules:

<u>Number</u>	<u>Title</u>	<u>Page</u>
1	Examination and Evaluation of Potable Water Supply Systems	57
2	Examination and Evaluation of Recreational Water	58
3	Chlorine Testing	59
4	Water Chlorination Procedures	60

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Water Sanitation

MODULE 1: EXAMINATION AND EVALUATION OF POTABLE WATER SUPPLY SYSTEMS

- TASKS
- a. Inspect watershed areas
 - b. Inspect water treatment plant procedures
 - c. Make a survey of treated water supply, e.g., tap, tanks
 - d. Determine whether water is safe for drinking

PERFORMANCE OBJECTIVE

- (Stimulus) When the need arises
(Behavior) The EHA will conduct a survey of the water supply systems (including watershed, treatment plant and distribution system) for health hazards
(Conditions) Using appropriate equipment, e.g., membrane filter, water test kits for chlorine, pH, salinity, iron, hardness, dissolved oxygen, etc.
(Consequence) Assure potable water sources

KNOWLEDGES AND SKILLS

Water treatment processes ashore and afloat
Geology (water strata), hydrology
Public health standards for water
Water handling equipment
The physical and chemical characteristics of water
Distribution systems
Water sources
Water tracing techniques
Standard methods for the analysis of water and waste water
Basic map making
Preparation of schematics
Collection, preservation and shipment of samples for laboratory examination
Principles and procedures for performing certain physical, chemical, microbiologic and tracer studies in the field
Recognition of cross connections, back siphonage and back flow problems in the distribution system

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Water Sanitation

MODULE 2: EXAMINATION AND EVALUATION OF RECREATIONAL WATER

- TASKS
- a. Determine whether water is safe for recreational use, e.g., swimming pools, bathing beaches
 - b. Inspect swimming pool and bathhouse
 - c. Determine pH and chlorine content of swimming pool
 - d. Supervise chlorination of swimming pool water
 - e. Recommend purification procedures for raw water supply

PERFORMANCE OBJECTIVE

- (Stimulus) At the request of the environmental health officer
(Behavior) The EHA will conduct a survey for a source of water for recreational purposes; inspect swimming pools for adequacy of water treatment, disinfection and safety; and answer questions on the operation of treatment facilities and disinfection
(Conditions) Using water test kits, pH meters, membrane filters and tracer techniques
(Criteria) According to the Manual of Naval Preventive Medicine (NavMed P5010)
(Consequence) A safe and protected recreational water source

KNOWLEDGES AND SKILLS

Recirculating water system in swimming pools
Safety hazards
Water-borne diseases
Water chemistry
Testing principles and procedures
Available physical treatment processes
Chemical treatment practices
Procedures to trouble-shoot operating problems in the water treatment processes
Recognition of potential water problem areas in the swimming pool and of appropriate corrective measures to be recommended
Emergency operation of water treatment processes
Recognition of unsafe conditions in bathing beach areas, e.g., high counts, swimmer's itch

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Water Sanitation

MODULE 3: CHLORINE TESTING

- TASKS
- a. Determine chlorine content of potable water
 - b. Interpret analysis results to specify appropriate use of water; e.g., drinking, washing
 - c. Determine cause and recommend correction of incomplete water purification

PERFORMANCE OBJECTIVE

- | | |
|---------------|--|
| (Stimulus) | At specified periods |
| (Behavior) | The EHA will determine the free available chlorine residual, pH and temperature of potable water and interpret analysis results to specify corrective measures for any discrepancies found |
| (Conditions) | Using a chlorine and pH colorimeter, thermometer |
| (Criteria) | According to the Manual of Naval Preventive Medicine (NavMed P5010) |
| (Consequence) | Identification of insufficient chlorination when the condition exists |
| (Next Action) | Correct any discrepancies |

KNOWLEDGES AND SKILLS

Water chemistry
Theory of chlorine disinfection of water
Forms of chlorine available for use
Safety factors of chlorine
Factors affecting chlorine efficiency
Substances that can increase chlorine efficiency
Use of chlorine test kit
Break point of chlorine
Procedures to determine chlorine demand of water
Procedures to determine free and combined available chlorine
Procedures to perform pH test on water that has not been bleached out by chlorine
Technique for explaining procedures and giving clear instructions

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Water Sanitation

MODULE 4: WATER CHLORINATION PROCEDURES

- TASKS
- a. Calculate amount of chlorine required for treatment of drinking water
 - b. Do chlorination of drinking water
 - c. Set up/review chlorine residual and pH record keeping
 - d. Recommend purification procedures for raw water supplies
 - e. Determine break point chlorination of water

PERFORMANCE OBJECTIVE

- (Stimulus) Upon determination of a need for chlorination and in the absence of regular water treatment personnel
- (Behavior) The EHA will calculate the amount of chlorine needed, chlorinate the water and set up and review chlorine, pH and temperature records
- (Conditions) Using chlorination equipment when available
- (Criteria) According to the Manual of Naval Preventive Medicine (NavMed P5010)
- (Consequence) An adequately chlorinated water supply
- (Next Action) Make appropriate entries in the chlorine residual records

KNOWLEDGES AND SKILLS

Types of chlorine
Safety precautions in handling chlorine
Definitions of residuals, free available chlorine and combined available chlorine
Theory of chlorine disinfection
Factors affecting chlorine disinfection
Understanding and calculating chlorine demand
Methods used in chlorination practices
Substances that increase the efficiency of chlorination
Calculation of chlorine dosage required for a given volume of water
Calibration and maintenance of direct displacement pumps
Improvisation of venturi principles in emergency chlorination of water supplies
Procedures for isolating and disinfecting contaminated areas of a distribution system

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

COMPETENCY UNIT IX: SEWAGE

This unit includes the following Modules:

<u>Number</u>	<u>Title</u>	<u>Page</u>
1	Sewage Treatment	62
2	Bacteriologic Testing of Sewage	63

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Sewage

MODULE 1: SEWAGE TREATMENT

- TASKS
- a. Inspect sewage treatment and disposal systems
 - b. Train nonmedical personnel in treatment and sampling of shipboard sewage

PERFORMANCE OBJECTIVE

- | | |
|---------------|--|
| (Stimulus) | When requested by the environmental health officer |
| (Behavior) | The EHA will inspect the sewage treatment and disposal system for health hazards; sample and analyze the sewage in its various stages of treatment; and teach nonmedical personnel the procedures for sewage treatment, sampling and testing |
| (Criteria) | According to standards set forth by BuShips, BuDocks, BuMed and the Manual of Naval Preventive Medicine |
| (Consequence) | Assure that no condition that might be hazardous to the health of personnel is present in the treatment and disposal system |

KNOWLEDGES AND SKILLS

Field sewage disposal methods
Septic tank systems
Shipboard sewage disposal
Biology of waste water
Waste water examination procedures
Waste water unit operations
Sludge treatment and disposal
Teaching skills
Sewage treatment plants (primary-sedimentation; secondary-biological exudation; tertiary-polishing)
Principles and techniques of various tests, e.g., biochemical oxygen demand, pH determinations, dissolved oxygen tests, chlorine residual tests, various related microbiologic tests
Recognition of cross-connections, back siphonage and back flow
Industrial waterborne wastes
Oxidation ponds or lagoons
Procedures to collect, preserve and ship samples for laboratory examination
Principles and techniques for use of fluorescein dye or other indicator to trace contaminations

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Sewage

MODULE 2: BACTERIOLOGIC TESTING OF SEWAGE

- TASKS
- a. Run bacteriologic tests on sewage
 - b. Perform BOD determination
 - c. Identify bacteria by basic culture techniques
 - d. Calculate and prepare percent solution
 - e. Do bacterial counts by dilution
 - f. Take samples of sewage effluent for analysis

PERFORMANCE OBJECTIVE

- (Stimulus) When requested by the environmental health officer
(Behavior) The EHA will take samples of effluent for analysis; conduct tests for the determination of biologic oxygen demand and dissolved oxygen content; identify bacteria by basic culture techniques and compute microbial density by standard plate count methods
(Conditions) Without supervision
(Criteria) In accordance with guidelines set forth in the Manual of Naval Preventive Medicine (NavMed P5010)
(Consequence) Identification of bacteria in sewage

KNOWLEDGES AND SKILLS

Definitions (e.g., sewage, BOD, Od)
Chemistry and composition of sewage
Membrane filter techniques
Sewage treatment processes
Federal policy on stream pollution
Biology of waste waters
The report of the National Technical Advisory Committee on Water Quality Criteria
Protozoology, bacteriology and virology of wastewater
Principles and procedures for performing various examinations, e.g., B.O.D. test, pH determinations, dissolved oxygen tests, chlorine residual tests, microbiologic tests
Collection, preservation and shipment of samples for laboratory examination

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

COMPETENCY UNIT X: POISONOUS PLANTS

This unit includes the following Modules:

<u>Number</u>	<u>Title</u>	<u>Page</u>
1	Poisonous Plants	65

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Poisonous Plants

MODULE 1: POISONOUS PLANTS

TASK a. Identify poisonous plants

PERFORMANCE OBJECTIVE

(Stimulus)	When requested by the environmental health officer
(Behavior)	The EHA will identify poisonous plants as to genus and species
(Conditions)	Without supervision; using a hand lens and plant identification keys in textbooks such as Field Book of Natural History, by Palmer
(Consequence)	Identification of poisonous plants in a given area
(Next Action)	Select approved herbicides and apply properly according to regulations

KNOWLEDGES AND SKILLS

Basic knowledge of botany
Taxonomic characteristics of plants
Knowledge of phytotoxic characteristics
How to use biologic keys
How to use hand magnifier

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

COMPETENCY UNIT XI: POISONOUS REPTILES

This unit includes the following Modules:

<u>Number</u>	<u>Title</u>	<u>Page</u>
1	Poisonous Reptiles	67

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Poisonous Reptiles

MODULE 1: POISONOUS REPTILES

- TASKS
- a. Identify species of snake suspected of inflicting bite
 - b. Give emergency treatment/first aid for snake bite

PERFORMANCE OBJECTIVE

- (Stimulus) When ordered by the environmental health officer
(Behavior) The EHA will identify the suspected reptile as to genus and species to provide information needed to treat a bite victim. In the absence of a physician the EHA will initiate emergency treatment/first aid measures as soon as possible, administering the appropriate antivenin when available
- (Conditions) Without supervision; using biologic keys and the Naval Manual for Poisonous Reptile Identification
- (Criteria) Accurate identification of the reptile and appropriate emergency treatment
- (Consequence) Identification of the reptile and initiation of emergency treatment when appropriate

KNOWLEDGES AND SKILLS

Habits and characteristics of snakes and other reptiles
Physiology of reptile bites
How to examine reptiles
Safety in handling reptiles
First aid treatment for snake bite
Knowledge of venom types, neurotoxin vs. hemotoxin
Use of identification keys
Reptile control techniques, e.g., repellents

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

COMPETENCY UNIT XII: HABITABILITY

This unit includes the following Modules:

<u>Number</u>	<u>Title</u>	<u>Page</u>
1	Inspections and Surveys	69

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Habitability

MODULE 1: INSPECTIONS AND SURVEYS

- TASKS
- a. Inspect beauty shop
 - b. Inspect barber shop
 - c. Judge the habitability of officer and enlisted living quarters
 - d. Inspect shower facilities
 - e. Inspect toilets and wash rooms
 - f. Inspect spaces for insect infestation
 - g. Inspect spaces for rodent infestation
 - h. Inspect berthing areas
 - i. Monitor contract housekeeping services
 - j. Inspect schools/nurseries for hygienic conditions
 - k. Inspect recreational facilities for hygienic conditions
 - l. Inspect office facilities and other work areas
 - m. Perform routine safety inspections
 - n. Inspect spaces for adequate ventilation
 - o. Inspect spaces for adequate lighting
 - p. Take relative humidity readings
 - q. Determine whether water is safe for recreational use, e.g., swimming pools, bathing beaches

PERFORMANCE OBJECTIVE

- (Stimulus) When ordered to do so by the commanding officer or on the basis of command instructions
- (Behavior) The EHA will carry out such inspections and surveys as may be required to insure that the health, comfort and safety of military and other personnel and their dependents will be protected; and report results to commanding officer
- (Conditions) Without supervision; using various light meters, anemometer, anemometer, thermometer, psychrometer
- (Criteria) According to guidelines set forth in the Manual Naval Preventive Medicine (NavMed P5010)
- (Consequence) Discovery of any adverse conditions
- (Next Action) Take appropriate actions to correct any adverse condition

KNOWLEDGES AND SKILLS

Habitability effects on health
Standards of habitability and their significance in affecting the habitability of spaces, e.g., electricity and lighting; heating and ventilation; structural, fire and general safety; waste

MODULE 1 (Continued)

storage and handling; pest control; water
supply; plumbing and recreational water supply
Use of appropriate equipment, e.g., light meters
(e.g., G.E. Weston, Executive) anemometer, almor
velometer, wet and dry bulb thermometers,
psychrometer
Interpretation and correlation of instrument
results and particular standard involved
Observation techniques of assessment of clean-
liness
Recognition of health and safety hazards
Communication skills

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

COMPETENCY UNIT XIII: HOSPITAL INFECTION CONTROL

This unit includes the following Modules:

<u>Number</u>	<u>Title</u>	<u>Page</u>
1	Monitoring Environment and Personnel	72
2	Monitoring Equipment and Supplies	73
3	Reporting Infections to Hospital Infection Committee	74
4	Infusion Product and Drug Culturing	75

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Hospital Infection Control

MODULE 1: MONITORING ENVIRONMENT AND PERSONNEL

- TASKS
- a. Assist with nosocomial examination of personnel
 - b. Perform area survey for bacterial contamination of air
 - c. Evaluate housekeeping procedures for cleaning and disinfecting
 - d. Determine and control sources of bacterial contamination
 - e. Dispose of hazardous materials; e.g., cultures, acids
 - f. Recommend concurrent/terminal disinfection methods

PERFORMANCE OBJECTIVE

- (Stimulus) When ordered by the proper authority
(Behavior) The EHA will assist in conducting hospital infection control studies, i.e., obtain specimens from personnel, equipment, surfaces (floors, walls, etc.) and the atmosphere; evaluate the effectiveness of materials used in cleaning and disinfecting, and advise hospital personnel on the proper methods of concurrent and terminal disinfections
(Conditions) With appropriate supervision; using recommended materials
(Consequence) Control and prevention of health hazards in the hospital
(Next Action) Report findings to administrator, housekeeper, safety officer and hospital infection committee

KNOWLEDGES AND SKILLS

Use and operation of appropriate equipment
Principles of disinfection, detergency
Standards of hygiene and housekeeping procedures
Calculation of statistical data
Principles and techniques of indicated tests
Role of hospital personnel in nosocomial infection
Recognition of problems in the field

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Hospital Infection Control

MODULE 2: MONITORING EQUIPMENT AND SUPPLIES

- TASKS
- a. Check instruments and supplies for sterilization
 - b. Check sterilizers, related equipment and material for effectiveness in sterilization
 - c. Check equipment and materials for effectiveness in disinfection

PERFORMANCE OBJECTIVE

- (Stimulus) According to established time schedule
(Behavior) The EHA will determine the effectiveness of disinfection and sterilization procedures by biologic testing; recommend when to use steam, gas, dry heat or cold sterilization and the combination of methods to be used for different materials; pack materials for sterilization and monitor the process, and maintain a log of results
(Conditions) Without supervision; using culture testing devices, asbestos gloves
(Criteria) Maintaining safety precautions and according to established instructions and **directives**
(Consequence) Adequate sterilization and disinfection of instruments, solutions and materials

KNOWLEDGES AND SKILLS

Culture testing and methods
Sterilization devices and their use
Methods of packing materials for sterilization
Principles and techniques of sterilization
Maintenance of sterilization equipment, e.g.,
field sterilizer, laboratory autoclave
Charting techniques

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Hospital Infection Control

MODULE 3: REPORTING INFECTIONS TO HOSPITAL INFECTION COMMITTEE

- TASKS
- a. Calculate lab diagnostic test results
 - b. Determine disease morbidity rates
 - c. Draw up statistical graphs, tables, charts
 - d. Report infections to infection committee

PERFORMANCE OBJECTIVE

- (Stimulus) When assigned to assist the infection surveillance officer in nosocomial infection control
- (Behavior) The EHA will evaluate clinical bacteriologic laboratory results, review patients' admission records and discuss patient charts with ward nursing supervisors; summarize the rate and incidence of nosocomial infection and report the data to the infection control committee
- (Conditions) Without supervision
- (Criteria) According to guidelines set forth in hospital operating procedures and American Public Health Association references
- (Consequence) This action will monitor the incidence of nosocomial infections and will point out the areas that require specific investigative and corrective measures

KNOWLEDGES AND SKILLS

Bacteria associated with hospital infections
Bacteria of normal flora
How to read clinical laboratory results
How to read patient administrative and clinical charts
How to determine nosocomial infections as opposed to community acquired or colonizations
Hospital service and division functions
Organization of hospital infection control committee

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Hospital Infection Control

MODULE 4: INFUSION PRODUCT AND DRUG CULTURING

- TASKS
- a. Obtain possibly contaminated infusion bottles and sets, IV fluids, etc.
 - b. Transport contaminated materials to laboratory maintaining **aseptic technique**
 - c. Culture implicated infusion products
 - d. Identify organisms present

PERFORMANCE OBJECTIVE

- (Stimulus) When ordered by the infection surveillance officer
(Behavior) The EHA will obtain the implicated infusion bottle and sets, e.g. IV fluid, albumin; transport to the laboratory; culture the remaining fluids and infusion sets and stain the cultures to identify any organism that might be present
(Consequence) Information produced for determining **whether the infusion set or product was the origin of an infection**

KNOWLEDGES AND SKILLS

Purpose of and methods for administration of the various products
Best method for accomplishing **aseptic transportation** of products to the laboratory
Appropriate culture media growth requirements for contaminating microorganisms
Methods for maintaining a valid sample

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

COMPETENCY UNIT XIV: INDUSTRIAL HYGIENE/OCCUPATIONAL HEALTH

This unit includes the following Modules:

<u>Number</u>	<u>Title</u>	<u>Page</u>
1	Conducting Industrial Safety Inspections . . .	77
2	Checking for Hazardous Gases and Fumes	78
3	Checking for Electrical Hazards	79
4	Lighting Survey	80
5	Noise Level Surveys	81

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Industrial Hygiene

MODULE 1: CONDUCTING INDUSTRIAL SAFETY INSPECTIONS

TASKS a. Perform routine safety inspections
 b. Remind personnel in occupationally hazardous
 areas to get required lab tests/physicals

PERFORMANCE OBJECTIVE

(Stimulus) At the request of the environmental health officer
(Behavior) The EHA will conduct a general routine safety
 inspection of industrial areas such as shipyards
 or shipboard workshops; check for discrepancies in
 personnel protection equipment; and provide
 corrective advice when necessary
(Conditions) With indirect supervision
(Consequence) This action will determine adequacy of personnel
 protective measures in industrial areas

KNOWLEDGES AND SKILLS

Basic principles of industrial hygiene and
occupational health
Safety regulations
Industrial operating procedures
Personnel protective equipment
Test equipment available
Use of test equipment

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Industrial Hygiene

MODULE 2: CHECKING FOR HAZARDOUS GASES AND FUMES

- TASKS
- a. Check toxic potential of cleaning agents used in closed spaces
 - b. Test for diesel gas fumes pollution of air
 - c. Test for welding gases in industrial areas
 - d. Test for carbon monoxide in closed spaces; e.g. cockpits
 - e. Recommend procedures for improvements for control of air pollutants, e.g. fumes
 - f. Inspect spaces for adequate ventilation

PERFORMANCE OBJECTIVE

- (Stimulus) When requested by the environmental health officer
(Behavior) The EHA will calibrate testing equipment; test for hazardous gases and fumes and proper ventilation in working and living spaces; and interpret results to determine if standard limits of concentration (i.e. TLV or MAC) have been exceeded
(Conditions) Using air sampling equipment and volumeters (e.g., Drager, Kitigawa)
(Criteria) Accurately and according to equipment operation manuals for detection of the exact concentration of gases
(Consequence) This action will determine whether working and living spaces have adequate ventilation and are free of toxic gases and fumes

KNOWLEDGES AND SKILLS

Basic chemistry
Types of hazardous gases (e.g. carbon monoxide, welding) and fumes
Basic industrial hygiene
Calibration of gauges and test equipment
Procedures for reading gauges
Techniques and principles for interpretation of test findings
Standard acceptable limits of gas/fume concentration, i.e., Threshold Limit Values (TLV) and Maximum Allowable Concentrations (MAC)

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Industrial Hygiene

MODULE 3: CHECKING FOR ELECTRICAL HAZARDS

- TASKS
- a. Check equipment for electrical grounding
 - b. Inspect for health hazards in confined areas, e.g., enclosed tanks
 - c. Check level of static electricity (conductivity) of floor/air
 - d. Check level of emissions from microwave ovens

PERFORMANCE OBJECTIVE

- | | |
|---------------|---|
| (Stimulus) | At the request of the environmental health officer |
| (Behavior) | The EHA will conduct an electrical safety inspection |
| (Conditions) | With minimal supervision; using appropriate testing equipment, e.g. electrical testing meters |
| (Criteria) | Accurately, according to established standards |
| (Consequence) | The detection of electrical hazards |
| (Next Action) | Report results |

KNOWLEDGES AND SKILLS

Basic understanding of electricity
Electrical safety standards
Basic industrial hygiene and occupational health
Reading and calibration of meters
Related mathematical computation
Procedures for testing electrical equipment
e.g., microlight testing equipment, mine
safety appliance electrostatic sampler,
anemotherm meter, almorvelometer, microwave
oven testing equipment
Ionizing vs. nonionizing radiation

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Industrial Hygiene

MODULE 4: LIGHTING SURVEY

TASK a. Inspect spaces for adequate lighting

PERFORMANCE OBJECTIVE

(Stimulus)	At the request of the environmental health officer
(Behavior)	The EHA will measure the adequacy of lighting in living and working spaces
(Conditions)	Using various light meters, e.g., Weston, Executive, General Electric
(Criteria)	According to commercial equipment operation manuals
(Consequence)	A determination of the adequacy of lighting in living and working spaces

KNOWLEDGES AND SKILLS

Basic understanding of lighting
Lighting standards
Use and calibration of equipment, including reading gauges
Principles and procedures for measuring the adequacy of lighting

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Industrial Hygiene

MODULE 5: NOISE LEVEL SURVEYS

- TASKS
- a. Conduct noise level surveys
 - b. Recommend appropriate ear protectors for personnel working in hazardous areas

PERFORMANCE OBJECTIVE

- (Stimulus) At the request of the environmental health officer
(Behavior) The EHA will conduct noise level surveys in living and working spaces and in outdoor areas such as jet airports; and recommend appropriate ear protectors for personnel working in hazardous areas
(Conditions) With minimal supervision; using various sound level meters
(Criteria) Accurate measurement of sound levels in working and living spaces and in outdoor areas and specification of appropriate ear protectors
(Consequence) The detection of noise hazards
(Next Action) Personnel will wear protective devices

KNOWLEDGES AND SKILLS

Basic anatomy of the ear
Basic industrial hygiene and occupational health
Hearing and noise standards
Ear protecting equipment
Operation and limitations of sound measurement equipment
Interpretation of test results

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

COMPETENCY UNIT XV: NBC EMERGENCY OPERATIONS

This unit includes the following Modules:

<u>Number</u>	<u>Title</u>	<u>Page</u>
1	NBC Emergency Operations	83

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: NBC Emergency Operations

MODULE 1: NBC EMERGENCY OPERATIONS

- TASKS
- a. Set up personnel decontamination stations
 - b. Advise personnel on protective equipment for NBC emergency situations
 - c. Advise on radiologic decontamination and protection
 - d. Collect chemical and biologic specimens

PERFORMANCE OBJECTIVE

- (Stimulus) When the need arises or when ordered by the environmental health officer
- (Behavior) The EHA will provide training and assistance for NBC emergency operations
- (Conditions) Using protective equipment, e.g., radiation detection devices; protective masks and clothing; and air samplers and sample bottles
- (Criteria) According to the Nuclear Handbook for Medical Service Personnel (TM8-215), Treatment of Chemical Agent Casualties (NavMed P5010) and Biological Warfare Duties of Medical Department Personnel (BuMed Inst. 3402.1)
- (Consequence) Personnel will be prepared in the event of an NBC emergency

KNOWLEDGES AND SKILLS

Organisms frequently involved in biologic emergencies
Chemicals frequently involved in chemical emergencies
Types of nuclear radiation
Effects of agents on health
Availability, function and use of equipment
Instructional techniques
Related mathematical calculations

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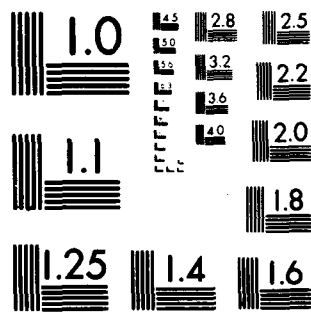
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Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

COMPETENCY UNIT XVI: OPERATIONAL SANITATION

This unit includes the following Modules:

<u>Number</u>	<u>Title</u>	<u>Page</u>
1	Field Habitability Inspection	85
2	Field Food and Water Inspections.	86
3	Field Waste Disposal.	87

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Operational Sanitation

MODULE 1: FIELD HABITABILITY INSPECTION

- TASKS
- a. Inspect field sanitation facilities
 - b. Recommend type of sanitation facilities for field construction
 - c. Supervise construction of wash-up hygienic facilities at field location
 - d. Inspect shower facilities
 - e. Inspect watershed areas
 - f. Specify preventive measures for effects of cold weather
 - g. Specify preventive measures for effects of hot weather

PERFORMANCE OBJECTIVE

- | | |
|---------------|--|
| (Stimulus) | When ordered by the commanding officer |
| (Behavior) | The EHA will inspect field sanitation facilities and field areas of operation, and will make recommendations for placement and construction of tents and sanitation and hygiene facilities to protect the health of personnel in the field |
| (Conditions) | Without supervision |
| (Criteria) | According to guidelines set forth in the Manual of Naval Preventive Medicine (NavMed P5010) and the Landing Party Manual (OpNav P34-03) |
| (Consequence) | Adequate field sanitation and hygiene facilities are provided during field operations |

KNOWLEDGES AND SKILLS

Requirements for field hygiene and sanitation facilities
Geology (cold and tropical)
Water- and food-borne diseases
Personal hygiene
Tropical plants
Venomous reptiles
Interpretation of written orders
Instructional skills
Written and spoken communications-skills

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Operational Sanitation

MODULE 2: FIELD FOOD AND WATER INSPECTION

- TASKS
- a. Inspect kitchens for cleanliness
 - b. Inspect dishwashing procedures for effectiveness
 - c. Inspect food storage areas for temperature, vermin, etc.
 - d. Treat fresh fruits and vegetables suspected of bacterial/parasite contamination
 - e. Inspect watershed areas
 - f. Determine whether water is safe for raw water supply
 - g. Recommend purification procedures for raw water supply

PERFORMANCE OBJECTIVE

- (Stimulus) Upon orders from the commanding officer
(Behavior) The EHA will inspect field food and water facilities
(Conditions) Without supervision; using a thermometer
(Criteria) According to guidelines in the Manual of Naval Preventive Medicine (NavMed P5010) and the Landing Party Manual (OpNav P34-03)
(Consequence) Risk of food- or water-borne infection is reduced

KNOWLEDGES AND SKILLS

Food and water sanitation standards
How to chlorinate water in water buffalo or lyster bag
How to read a thermometer
How to perform chlorine testing procedures
Principles of field kitchen layout
Principles of field food sanitation
Principles of field water treatment
Recognition of food spoilage

Competency: ENVIRONMENTAL HEALTH ASSISTANT (EHA)

Unit: Operational Sanitation

MODULE 3: FIELD WASTE DISPOSAL

TASKS a. Inspect waste disposal operation
 b. Inspect refuse disposal facilities
 c. Provide advice on disposal of human excreta

PERFORMANCE OBJECTIVE

(Stimulus) When ordered to do so
(Behavior) The EHA will inspect waste disposal methods in the
 field, and recommend methods of refuse and
 human waste disposal
(Conditions) Without supervision
(Criteria) According to Manual of Naval Preventive Medicine
 (NavMed P5010)
(Consequence) Elimination of field sanitation situations
 detrimental to the health and safety of personnel

KNOWLEDGES AND SKILLS

Geology
Field operations
Field sanitation principles
Methods of human waste disposal, e.g., cat hole,
 straddle trench, pit latrine
Methods of refuse disposal, e.g., hillside
 incinerator, box-type, baffle grease traps

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